

# Программа поддержки физико-математического профиля по английскому языку

Автор: Стяжкина Елена Вадимовна

## Цели программы:

- сформировать у учащихся целостное представление о некоторых открытиях в области науки и техники;
- реализовать коммуникативные, аудитивные способности учеников в ходе обучения профилю;
- познакомить с некоторыми видами технического перевода на примере аутентичных текстов;
- повышение уровня культуры мышления, общение и речь.

Содержание разделов программы	Кол-во часов
<b>Тема N1 «Математика для всех»</b>	2
<b>Тема N2 «Что такое компьютер?»</b>	8
Устройство компьютера	3
Типы электронных данных	3
Английский математик и инженер Ч. Бэббидж	2
<b>Тема N3 «Программа – Windows-95»</b>	8
Международная компьютерная сеть	3
Операционные системы	3
Билл Гейтс	2
<b>Тема N4 «Металлы»</b>	8
Сталь	3
Методы термической обработки стали	3
Великий русский ученый – Менделеев	2
<b>Тема N5 «Пластмасса»</b>	8
Типы пластмасс	3
Композиционные материалы	3
Альфред Нобель	2
<b>Тема N6 «Сварка»</b>	8
Виды сварки	6
Джеймс Джоуль	2
<b>Тема N7 «Автоматизация»</b>	11
Виды автоматизации	4
Работы в производстве	4
Дж. Ватт	3
<b>Тема N8 «Моя будущая профессия»</b>	15

Моя будущая профессия – компьютерный инженер	2
Будущее инженерной профессии	3
Московский Государственный Университет	3
Известные люди науки и инженерии: Сикорский И.И., Туполев А.Н., Стефенсон Д.	6
<b>Итого</b>	<b>68</b>

Тематическое планирование физико-математического профиля по английскому языку

## UNIT8 COMPUTERS

I. Text A: "What is a computer?", Text B: "Hardware", Text C: "Types of software"

II. Famous people of science and engineering: Charles Babbage.

### Text A: "WHAT IS A COMPUTER?"

The term **computer** is used to describe a device made up of a combination of electronic and electromechanical part (electronic and part mechanical) components. Computer has no intelligence by itself and **is referred to as hardware**. A computer system is a combination of five elements:

- Hardware
- Software
- People
- Procedures
- Data/information

When one computer system is set up to communicate with another computer system, connectivity becomes the sixth system element. In other words, the manner in which the various individual systems are connected - for example, by phone lines, **microwave** transmission, or satellite - is an element of the total computer system.

**Software** is the term used to describe the instructions that tell the hardware how to perform a task. Without software instructions, the hardware doesn't know what to do. People, however, are the most important component of the computer system: they create the computer software instructions and respond to the procedures that those instructions present.

The basic job of the computer is the processing of information. Computers accept information in the form of **instruction** called a **program** and **characters** called **data** to perform mathematical and logical operations, and then give the results. The data is raw material while **information** is organized, processed, refined and useful for decision making. Computer is used to convert data into information. Computer is also used to store information in the digital form.

<b>characters</b> - символы	<b>raw</b> - необработанный, сырой
<b>data</b> - данные	<b>to come to life</b> - оживать
<b>decision</b> - решение	<b>to connect</b> - соединять
<b>device</b> - устройство	<b>to convert</b> - превращать, преобразовывать
<b>hardware</b> - оборудование	<b>to create</b> - создавать
<b>instruction</b> - команда	<b>to evaluate</b> - оценивать
<b>intelligence</b> - разум	<b>to refer to as</b> - называть что-либо
<b>manner</b> - манера, способ	<b>to refine</b> - очищать

<b>microwave</b> - микроволновая	<b>to respond</b> - отвечать
<b>procedures</b> - процедуры, операции	<b>transmission</b> - передач
<b>purpose</b> - цель	<b>various</b> - различные

**Vocabulary:**

**General understanding:**

- What does the term "computer" describe?
- Is computer intelligent?
- What are five components of computer system?
- What is connectivity?
- What is software? What's the difference between hardware and software?
- Why people are the most important component of a computer system?
- In what way terms "data" and "information" differ?
- How does computer convert data into information?

**Exercise 8.1. Which of the listed below terms have Russian equivalents:**

computer, diskette, metal, processor, scanner, information, data, microphones, printer, modem, Internet.

**Exercise 8.2. Which of the listed above statements are true/false. Specify your answer using the text.**

1. Computer is made of electronic components so it is referred to as electronic device.
2. Computer has no intelligence until software is loaded.
3. There are five elements of computer system: hardware, software, people, diskettes and data.
4. The manner in which computers are connected is the connectivity.
5. Without software instructions hardware doesn't know what to do.
6. The software is the most important component because it is made by people.
7. The user inputs data into computer to get information as an output.
8. Computer is used to help people in decision making process.

**Exercise 8.3. Match the following:**

1. ... doesn't come to life until it is connected to other parts of a system.
2. ... is the term used to describe the instructions that tell the hardware how to perform a task.
3. ... create the computer software instructions and respond to the procedures that those instructions present
4. Information in the form of instruction is called a...
5. The manner in which the various individual systems are connected is...
6. ... is organized, processed and useful for decision making
7. The basic job of the computer is the...
  - a. program
  - b. information
  - c. processing of information
  - d. software
  - e. connectivity
  - f. computer
  - g. people

**Exercise 8.4. Translate the text. Retell the text, using the vocabulary.**

**Exercise 8.5. Questions for group discussion:**

1. Why so many people are still "computer illiterate"?
2. What are the most important applications of computer? (Are computer games just a "waste of time" or it is a nice hobby and a lot of fun?)
3. Who has a computer in your group? Ask them what they use it for?

**Text B: "HARDWARE"**

What is hardware? Webster's dictionary gives us the following definition of the hardware - **the mechanical, magnetic, electronic, and electrical devices composing a computer system.** Computer hardware can be divided into four categories:

1. input hardware
2. processing hardware
3. storage hardware
4. output hardware

### **Input hardware**

The purpose of the input hardware is to collect data and convert it into a form suitable for computer processing. The most common input device is a **keyboard**. It looks very much like a typewriter. The **mouse** is a hand held device connected to the computer by small cable. As the mouse is rolled across the mouse pad, the cursor moves across the screen. When the cursor reaches the desired location, the user usually pushes a button on the mouse once or twice to signal a menu selection or a command to the computer.

The **light pen** uses a light sensitive photoelectric cell to signal screen position to the computer. Another type of input hardware is optic-electronic **scanner** that is used to input graphics as well as typeset characters. **Microphone** and **video camera** can be also used to input data into the computer. Electronic cameras are becoming very popular among the consumers for their relatively low price and convenience.

### **Processing hardware**

The purpose of processing hardware is retrieve, interpret and direct the execution of software instructions provided to the computer. The most common components of processing hardware are the Central Processing Unit and main memory.

The Central Processing Unit (CPU) is the brain of the computer. It reads and interprets software instructions and coordinates the processing activities that must take place. The design of the CPU affects the processing power and the speed of the computer, as well as the amount of main memory it can use effectively. With a well-designed CPU in your computer, you can perform highly sophisticated tasks in a very short time.

**Memory** is the system of component of the computer in which information is stored. There are two types of computer memory: RAM and ROM.

**RAM** (random access memory) is the volatile computer memory, used for creating loading, and running programs and for manipulating and temporarily storing data;

**ROM** (read only memory) is nonvolatile, non-modifiable computer memory, used to hold programmed instructions to the system.

The more memory you have in your computer, the more operations you can perform.

### **Storage hardware**

The purpose of storage hardware is to store computer instructions and data in a form that is relatively permanent and retrieve when needed for processing. Storage hardware serves the same basic functions as do office filing systems except that it stores data as electromagnetic signals. The most common ways of storing data are Hard disk, floppy disk and CD-ROM.

**Hard disk** is a rigid disk coated with magnetic material, for storing programs and relatively large amounts of data.

**Floppy disk** (diskette) - thin, usually flexible plastic disk coated with magnetic material, for storing computer data and programs. There are two formats for floppy disks: 5.25" and 3.5". 5.25" is not used in modern computer systems because of its relatively large size flexibility and small capacity. 3.5" disks are formatted 1.4 megabytes and are widely used.

**CD-ROM** (compact disc read only memory) is a compact disc on which a large amount of digitized read-only data can be stored. CD-ROMs are very popular now because of the growing speed which CD-ROM drives can provide nowadays.

### **Output hardware**

The purpose of output hardware is to provide the user with the means to view information produced by the computer system. Information is output in either **hardcopy** or **softcopy** form. Hardcopy output can be held in your hand, such as paper with text (word or numbers) or graphics printed on it. Softcopy output is displayed on a monitor.

**Monitor** is a component with a display screen for viewing computer data, television programs, etc.

**Printer** is a computer output device that produces a paper copy of data or graphics.

**Modem** is an example of **communication hardware** - an electronic device that makes possible the transmission of data to or from computer via telephone or other communication lines.

Hardware comes in many configurations, depending on what the computer system is designed to do. Hardware can fill several floors of a large office building or can fit on your lap.

<b>amount</b> - количество	<b>capacity</b> - вместительность
<b>circuitry</b> - эл. цепи	<b>CPU, microprocessor</b> - микропроцессор
<b>hard disk</b> - жесткий диск, "винчестер"	<b>input hardware</b> - устройства ввода данных
<b>keyboard</b> - клавиатура	<b>sophisticated</b> - сложный
<b>lap</b> - колени	<b>storage hardware</b> - устройства хранения данных
<b>modem</b> - модем	<b>mouse</b> - устройство для перемещения объектов на экране, "мышь"
<b>temporarily</b> - временно	<b>temporary</b> - временный
<b>output hardware</b> - выходные устройства отображения информации	<b>the purpose</b> - цель
<b>tier</b> - ярус	<b>printer</b> - принтер
<b>to affect</b> - влиять	<b>processing hardware</b> - устройства обработки данных
<b>to connect</b> - соединять	<b>to convert</b> - преобразовывать
<b>RAM</b> - ОЗУ (оперативное запоминающее устройство)	<b>to direct</b> - управлять
<b>to execute</b> - выполнять	<b>ROM</b> - ПЗУ (постоянное запоминающее устройство)
<b>to interpret</b> - переводить	<b>to provide</b> - обеспечивать
<b>CD-ROM</b> - накопитель на компакт-дисках (CD)	<b>to reach</b> - достигать
<b>to retrieve</b> - извлекать	<b>scanner</b> - сканер
<b>to roll</b> - катать, перекатывать	<b>sensitive</b> - чувствительный
<b>volatile</b> - летучий, нестойкий, временный	

**Vocabulary:**

**General understanding:**

1. What is the Webster's dictionary definition of the hardware?
2. What groups of hardware could be defined?
3. What is input hardware? What are the examples of input hardware?
4. What is mouse designed for? What is a light pen?
5. What is processing hardware? What are the basic types of memory used in a PC?
6. Can a PC-user change the ROM? Who records the information in ROM?

7. What is storage hardware? What is CD-ROM used for? Can a user record his or her data on a CD? What kind of storage hardware can contain more information: CD-ROM, RAM or ROM?
8. What is modem used for? Can PC-user communicate with other people without a modem?

**Exercise 8.6. Which of the listed below statements are true/false. Specify your answer using the text.**

1. Computer is an electronic device therefore hardware is a system of electronic devices.
2. The purpose of the input hardware is to collect data and convert it into a form suitable for computer processing.
3. Scanner is used to input graphics only.
4. The purpose of processing hardware is to retrieve, interpret and direct the execution of software instructions provided to the computer.
5. CPU reads and interprets software and prints the results on paper.
6. User is unable to change the contents of ROM.
7. 5.25" floppy disks are used more often because they are flexible and have more capacity than 3.5" disks.
8. Printer is a processing hardware because its purpose is to show the information produced by the system.
9. Modem is an electronic device that makes possible the transmission of data from one computer to another via telephone or other communication lines.
10. The purpose of storage hardware is to store computer instructions and data in a form that is relatively permanent and retrieve them when needed for processing.

**Exercise 8.7. Give definitions to the following using the vocabulary**

1. CPU
2. ROM
3. Floppy-disk
4. CD-ROM
5. Printer
6. Modem
7. Motherboard
8. Hard disk
9. Keyboard
10. Sound-card

**Exercise 8.8. Which of the following is Hardware:**

1. program
2. mouse
3. CPU
4. printer
5. modem
6. command
7. port
8. cursor or the pointer
9. keyboard
10. character

**Exercise 8.9. Match the following:**

1. процессор
2. клавиатура
3. мышь
4. дискета
5. "винчестер"
6. модем
7. экран
8. ПЗУ
9. ОЗУ
- a. nonvolatile, non-modifiable computer memory, used to hold programmed instructions to the system.

- b. the part of a television or computer on which a picture is formed or information is displayed.
- c. rigid disk coated with magnetic material, for storing computer programs and relatively large amounts of data.
- d. an electronic device that makes possible the transmission of data to or from computer via telephone or other communication lines.
- e. a set of keys, usually arranged in tiers, for operating a typewriter, typesetting machine, computer terminal, or the like.
- f. volatile computer memory, used for creating, loading, and running programs and for manipulating and temporarily storing data; main memory.
- g. central processing unit: the key component of a computer system, containing the circuitry necessary to interpret and execute program instructions.
- h. a palm-sized device equipped with one or more buttons, used to point at and select items on a computer display screen and for controlling the cursor by means of analogous movement on a nearby surface.
- i. a thin, usually flexible plastic disk coated with magnetic material, for storing computer data and program.

#### **Questions for group discussion:**

1. Without what parts computer is unable to work?
2. What is the most expensive part of the hardware?
3. What other hardware devices do you know? What are they for? Do you know how to use them?

#### **Text C: "TYPES OF SOFTWARE"**

A computer to complete a job requires more than just the actual equipment or hardware we see and touch. It requires Software - programs for directing the operation of a computer or electronic data.

Software is the final computer system component. These computer programs instruct the hardware how to conduct processing. The computer is merely a general-purpose machine which requires specific software to perform a given task. Computers can input, calculate, compare, and output data as information. Software determines the order in which these operations are performed.

Programs usually fall in one of two categories: system **software and applications software**.

**System software** controls standard internal computer activities. An operating system, for example, is a collection of system programs that aid in the operation of a computer regardless of the application software being used. When a computer is first turned on, one of the systems programs is booted or loaded into the computers memory. This software contains information about memory capacity, the model of the processor, the disk drives to be used, and more.

Once the system software is loaded, the applications software can be brought in.

System programs are designed for the specific pieces of hardware. These programs are called drivers and coordinate peripheral hardware and computer activities. User needs to install a specific driver in order to activate a peripheral device. For example, if you intend to buy a printer or a scanner you need to worry in advance about the driver program which, though, commonly goes along with your device. By installing the driver you "teach" your mainboard to "understand" the newly attached part.

Applications software satisfies your specific need. The developers of application software rely mostly on marketing research strategies trying to do their best to attract more users (buyers) to their software. As the productivity of the hardware has increased greatly in recent years, the programmers nowadays tend to include as much as possible in one program to make software interface look more attractive to the user. These class of programs is the most numerous and perspective from the marketing point of view.

Data communication within and between computers systems is handled by system software.

**Communications software** transfers data from one computer system to another. These programs usually provide users with data security and error checking along with physically transferring data between the two computer's memories. During the past five years the developing electronic network communication has stimulated more and more companies to produce various communication software, such as Web-Browsers for Internet.

<b>aid</b> - помощь	<b>to check</b> - проверять
<b>to attach</b> - присоединять	<b>to complete</b> - совершать, завершать
<b>control</b> - управление	<b>to conduct</b> - проводить
<b>developer</b> - разработчик	<b>to develop</b> - развивать, проявлять
<b>equipment</b> - оборудование	<b>to direct</b> - управлять, руководить
<b>general-purpose</b> - общего назначения	<b>to handle</b> - управлять, обращаться с
<b>internal</b> - внутренний	<b>to install</b> - устанавливать, встраивать, инсталлировать
<b>mainboard</b> - материнская плата	<b>memory capacity</b> - вместимость памяти
<b>to provide with</b> - обеспечивать чем-либо	<b>peripheral</b> - периферийный
<b>to require</b> - требовать	<b>regard</b> - отношение
<b>to secure</b> - обеспечивать безопасность	<b>regardless</b> - несмотря на, безотносительно,
<b>to transfer</b> - переводить, переносить	<b>Web-browser</b> - "браузер" программа просмотра страниц
<b>security</b> - безопасность	<b>specific</b> - конкретный, определенный
<b>to boot</b> - загружать	

**Vocabulary:**

**General understanding**

1. What is software?
2. In what two basic groups software (programs) could be divided?
3. What is system software for?
4. What is an operating system - a system software or application software?
5. What is a "driver"?
6. What is application software?
7. What is application software used for?
8. What is the tendency in application software market in the recent years?
9. What is the application of the communication software?

**Exercise 8.10. Which of the following is Software:**

1. Program
2. Mouse
3. CPU
4. Word processor
5. Modem
6. Web-browser
7. Operating system
8. Scanner
9. Printer
10. Display

**Exercise 8.11. Which of the listed below statements are true/false. Specify your answer using the text:**

1. Computer programs only instruct hardware how to handle data storage.
2. System software controls internal computer activities.
3. System software is very dependable on the type of application software being used.
4. The information about memory capacity, the model of the processor and disk drives are unavailable for system software.
5. The driver is a special device usually used by car drivers for Floppy-disk driving.

6. It is very reasonable to ask for a driver when you buy a new piece of hardware.
7. Software developers tend to make their products very small and with poor interface to save computer resources.
8. Communication software is in great demand now because of the new advances in communication technologies.
9. Application software is merely a general-purpose instrument.
10. Web-browsers is the class of software for electronic communication through the network.

**Exercise 8.12. Find English equivalents in the text:**

1. Программное обеспечение определяет порядок выполнения операций.
2. Прикладные программы выполняют поставленную вами конкретную задачу (удовлетворяют вашу потребность).
3. Этот класс программ - самый многочисленный и перспективный с точки зрения маркетинга.
4. Системные программы предназначены для конкретных устройств компьютерной системы.
5. Устанавливая драйвер, вы учите" систему "понимать" вновь присоединенное устройство.
6. Когда компьютер впервые включается, одна из системных программ должна быть загружена в его память.
7. Развитие систем электронной коммуникации за последние пять лет стимулировало производство соответствующих программных продуктов возрастающим числом компаний-разработчиков.

**Exercise 8.13. Give definitions to the following using the vocabulary:**

1. Software
2. Driver
3. Application software
4. Operating system
5. Communication software
6. Computer
7. Peripheral device
8. Operating system

**Questions for group discussion:**

1. What do you think is more expensive - hardware or software?
2. Has anyone in your group ever purchased software? Why do you think piracy (audio, video, computer software) still exists?

**FAMOUS PEOPLE OF SCIENCE AND ENGINEERING**

**Babbage, Charles** (1792-1871), British mathematician and inventor, who designed and built mechanical computing machines on principles that anticipated the modern electronic computer. Babbage was born in Teignmouth, Devon, and educated at the University of Cambridge. He became a Fellow of the Royal Society in 1816 and was active in the founding of the Analytical, the Royal Astronomical, and the Statistical Societies.

In the 1820s Babbage began developing his Difference Engine, a mechanical device that could perform simple mathematical calculations. Although Babbage started to build his machine, he was unable to complete it because of a lack of funding. In the 1830s Babbage began developing his Analytical Engine, which was designed to carry out more complicated calculations, but this device was never built, too. Babbage's book, "Economy of Machines and Manufactures" (1832), initiated the field of study known today as operational research.